AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1.   (Previously Presented) A battery state diagnosing device comprising:

a load applying section applying a load to a battery;

a measuring section measuring input and output characteristics of the battery in response to the applied load; and

a diagnosing section diagnosing a state of the battery by applying a transient result obtained from the measurement to a mathematical expression obtained by a system identification method, wherein

said battery state diagnosing device applies the load to the battery as a current load.

2.   (Cancelled)

3.   (Cancelled)

4.   (Previously Presented) The battery state diagnosing device as set forth in claim 16, wherein:

in order to remove the perpendicular component from the terminal voltage, a voltage value at a rise of a voltage pulse representing the electromotive force component of the battery is calculated from a voltage wave form of the terminal

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voltage, and the calculated value of the voltage pulse is subtracted from the terminal voltage.

5.   (Previously Presented) A battery state diagnosing device comprising:

a load applying section applying a current to a battery,

a measuring section measuring input and output characteristics of the battery in response to the applied load, and

a diagnosing section diagnosing a state of the battery by applying a result of the measurement to a mathematical expression obtained by a system identification method, wherein

the load applying section applies a current to the battery when the battery is not supplied with fuel.

6.   (Previously Presented) A battery state diagnosing device for applying load to a battery, measuring input and output characteristics of the battery, and diagnosing a state of the battery by applying a result of the measurement to a mathematical expression obtained by a system identification method, said battery state diagnosing device comprising:

a circuit section for constituting a closed circuit by serially connecting the battery to a current load when diagnosing the battery;

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a measuring section, connected to the circuit section, for measuring a

terminal voltage of the battery and a current flowing in the circuit section; and

a diagnosing section for diagnosing, by the system identification

method, a state of the battery based on a transient result obtained from the

measurement by the measuring section.

7.   (Previously Presented) A battery state diagnosing device for applying a

current to a battery, measuring input and output characteristics of the battery, and

diagnosing a state of the battery by applying a result of the measurement to a

mathematical expression obtained by a system identification method, the battery being

a fuel cell that is not supplied with fuel,

said battery state diagnosing device comprising:

a circuit section for constituting a closed circuit by serially connecting

the battery to a voltage source when diagnosing the battery;

a measuring section, connected to the circuit section, for measuring a

terminal voltage of the battery and a current flowing in the circuit section; and

a diagnosing section for diagnosing, by the system identification

method, a state of the battery based on a result of the measurement by the measuring

section.

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8.   (Currently Amended) A battery state diagnosing method comprising

the steps of:

applying a load to a battery;

measuring input and output characteristics of the battery in response to

the applied load; ~~and~~

diagnosing a state of the battery by applying a transient result obtained

from the measurement to a mathematical expression obtained by a system

identification method~~, wherein~~ : and

outputting the state of the battery diagnosed in the diagnosing step,

wherein

said step of applying a load to the battery serially connects the battery

to a current load.

9.   (Cancelled)

10.   (Cancelled)

11.   (Previously Presented) The battery state diagnosing method as set forth

in claim 18, wherein:

in order to remove the perpendicular component from the terminal

voltage, a voltage value at a rise of a voltage pulse representing the electromotive

force component of the battery is calculated from a voltage wave form of the terminal

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voltage, and the calculated value of the voltage pulse is subtracted from the terminal

voltage.

12.   (Currently Amended) A battery state diagnosing method comprising

the steps of:

applying a current to a battery,

measuring input and output characteristics of the battery in response to

the applied current, ~~and~~

diagnosing a state of the battery by applying a result of the

measurement to a mathematical expression obtained by a system identification

method, ~~wherein~~ ; and

<u>outputting the state of the battery diagnosed in the diagnosing step,</u>

<u>wherein</u>

the current is applied to the battery when the battery is not supplied

with fuel, and

said step of applying a current serially connects the battery to a

voltage source.

13. (Cancelled)

14. (Cancelled)

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15. (Previously Presented) A battery state diagnosing device comprising:

a load applying section applying a load to a battery;

a measuring section measuring input and output characteristics of the battery in response to the applied load; , and

a diagnosing section diagnosing a state of the battery by applying a result of the measurement to a mathematical expression obtained by a system identification method, wherein

said battery state diagnosing device applies the load to the battery as a current load;

the measured output characteristic is a terminal voltage of the battery; and

when diagnosing the battery by system identification, an electromotive force component of a fluctuating terminal voltage of the battery is removed as a bias, and a voltage fluctuation after the electromotive force component has been removed is amplified and used for the diagnosis by the system identification.

16. (Previously Presented) A battery state diagnosing device comprising:

a load applying section applying a load to a battery;

a measuring section measuring input and output characteristics of the battery in response to the applied load; and

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a diagnosing section diagnosing a state of the battery by applying result

of the measurement to a mathematical expression obtained by a system identification

method, wherein

said battery state diagnosing device applies the load to the battery as a

current load;

the measured output characteristic is a terminal voltage of the battery;

and

when diagnosing the battery by a system identification, a fluctuating

terminal voltage of the battery is separated into a perpendicular component which

derives from a serial resistance of the battery, and a component representing

Capacitance-Resistance dynamics;

the perpendicular component is removed from the terminal voltage; and

a voltage fluctuation after the perpendicular component has been

removed is amplified and used for the diagnosis by the system identification.

17. (Currently Amended) A battery state diagnosing method comprising the

steps of:

applying a load to a battery;

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measuring input and output characteristics of the battery in response to the applied load; ~~and~~

diagnosing a state of the battery by applying a result of the measurement to a mathematical expression obtained by a system identification method~~; wherein~~ ; and

outputting the state of the battery diagnosed in the diagnosing step, wherein

said step of applying a load to the battery serially connects the battery to a current load;

the measured output characteristic is a terminal voltage of the battery; and

when diagnosing the battery by system identification, an electromotive force component of a fluctuating terminal voltage of the battery is removed as a bias, and a voltage fluctuation after the electromotive force component has been removed is amplified and used for the diagnosis by the system identification.

18. (Currently Amended) A battery state diagnosing method comprising the steps of:

applying a load to a battery;

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measuring input and output characteristics of the battery in response to the applied load; ~~and~~

diagnosing a state of the battery by applying a result of the measurement to a mathematical expression obtained by a system identification method~~, wherein~~ ; and

outputting the state of the battery diagnosed in the diagnosing step, wherein

said step of applying a load to the battery serially connects the battery to a current load;

the measured output characteristic is a terminal voltage of the battery; and

when diagnosing the battery by a system identification, a fluctuating terminal voltage of the battery is separated into a perpendicular component which derives from a serial resistance of the battery, and a component representing Capacitance-Resistance dynamics;

the perpendicular component is removed from the terminal voltage and

a voltage fluctuation after the perpendicular component has been removed is amplified and used for the diagnosis by the system identification.

19. (Cancelled)

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20. (Cancelled)

21. (Cancelled)

22. (Cancelled)

23. (Previously Presented) A battery state diagnosing method comprising:

a load applying section applying a load to a battery;

a measuring section measuring input and output characteristics of the battery in response to the applied load; and

a diagnosing section diagnosing a state of the battery by applying a transient result obtained from the measurement to a mathematical expression obtained by a system identification method, wherein

said battery state diagnosing device applies the load to the battery as a current load,

wherein the measured output characteristic is a terminal voltage of the battery; and

the diagnosing section removes an electromotive force component of a fluctuating terminal voltage of the battery to obtain the transient result, and amplifies this transient result for diagnosis by the system identification.

24. (Previously Presented) A battery state diagnosing method comprising:

a load applying section applying a load to a battery;

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a measuring section measuring input and output characteristics of the battery in response to the applied load; and

a diagnosing section diagnosing a state of the battery by applying a transient result obtained from the measurement to a mathematical expression obtained by a system identification method, wherein

said battery state diagnosing device applies the load to the battery as a current load,

wherein the measured output characteristic is a terminal voltage of the battery; and

the diagnosing section is operable to;

separate a fluctuating terminal voltage of the battery into a perpendicular component which derives from a serial resistance of the battery, and a component representing Capacitance-Resistance dynamics;

remove the perpendicular component from the terminal voltage to obtain the transient result; and

amplify the transient result obtained after the perpendicular component has been removed for diagnosis by the system identification.

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